

PROCEEDINGS

OF THE

AMERICAN SOCIETY

OF

CIVIL ENGINEERS

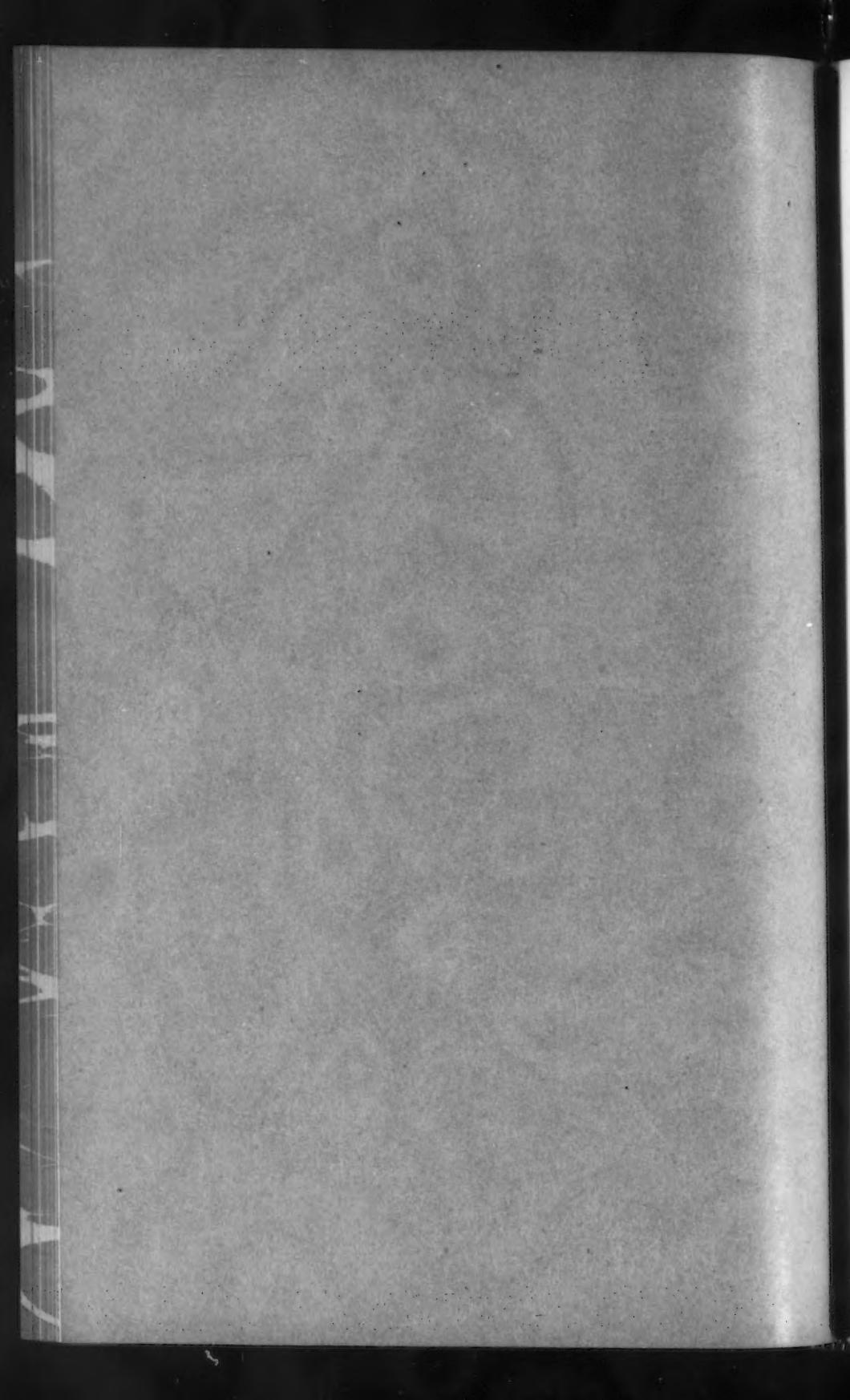
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PROCEEDINGS
OF THE
AMERICAN SOCIETY
OF
CIVIL ENGINEERS
(INSTITUTED 1852)

VOL. XXXVIII—No. 4
APRIL, 1912

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NEW YORK 1912

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The House of the Society is open from 9 A. M. to 10 P. M. every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

HOUSE OF THE SOCIETY—220 WEST FIFTY-SEVENTH STREET, NEW YORK.

TELEPHONE NUMBER.....5913 Columbus.
CABLE ADDRESS....."Ceas, New York."

AMERICAN SOCIETY OF CIVIL ENGINEERS
 INSTITUTED 1852

PROCEEDINGS

This Society is not responsible for any statement made or opinion expressed in its publications.

SOCIETY AFFAIRS

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MINUTES OF MEETINGS

OF THE SOCIETY

March 20th, 1912.—The meeting was called to order at 8.30 P. M.; Director T. Kennard Thomson in the chair; Chas. Warren Hunt, Secretary; and present, also, 91 members and 11 guests.

A paper by Charles B. Buerger, Assoc. M. Am. Soc. C. E., entitled "Rebuilding Three Large Pumping Engines," was presented by the author, and the subject was discussed orally by T. C. Atwood, M. Am. Soc. C. E., and the author.

The Secretary announced the following deaths:

GEORGE WALLACE MELVILLE, elected Honorary Member, December 20th, 1899; died March 17th, 1912.

THOMAS MOORE JACKSON, elected Member, June 3d, 1891; died February 3d, 1912.

LA FAYETTE OLNEY, elected Member, October 7th, 1868; died March 2d, 1912.

Adjourned.

April 3d, 1912.—The meeting was called to order at 8.30 p. m.; Director T. Kennard Thomson in the chair; Chas. Warren Hunt, Secretary; and present, also, 115 members and 17 guests.

The minutes of the meetings of February 21st and March 6th, 1912, were approved as printed in *Proceedings* for March, 1912.

A paper entitled "A Four-Track Center-Bearing Railroad Draw Span," by Louis H. Shoemaker, M. Am. Soc. C. E., was presented by the Secretary, and the subject was discussed orally by H. J. Cole, M. Am. Soc. C. E.

The Secretary announced the election of the following candidates on April 2d, 1912:

As MEMBERS

JAMES BONNYMAN, Birmingham, Ala.
FREDERICK JULIUS CELLARIUS, Dayton, Ohio
ALEXANDER SCOTT DAWSON, Calgary, Alta., Canada
FRANK THOMAS McGINNIS, New York City
JEAN LECLERC DE PULLIGNY, New York City
ROBERT JOHN REIDPATH, Buffalo, N. Y.
CLARKE STULL SMITH, Memphis, Tenn.

As ASSOCIATE MEMBERS

WILLIAM HENRY ADAMS, Detroit, Mich.
JAMES HENRY MILLAR ANDREWS, Philadelphia, Pa.
SVEND BARFOED, Reno, Nev.
HAROLD WILLIAM BEERS, Atlanta, Ga.
DUDELY FRANK BLACK, Los Angeles, Cal.
ROYAL DOUGLAS BRADBURY, Boston, Mass.
WILLIAM SMITH BROWNELL, JR., Newport, R. I.
HOWARD DORISS, Boston, Mass.
JOHN GODFREY ELLENDT, Rochester, N. Y.
EBER J ELLSWORTH, Pittsburgh, Pa.
JOHN CONRAD FITTERER, Laramie, Wyo.
WILLIAM KAISER FREUDENBERGER, Carson City, Nev.
ARCHIBALD GARDNER, St. Fereol, Que., Canada.
CLAUDE CLEMENT HOCKLEY, Grand Mere, Que., Canada
FREDERICK WILLIAM KASSEBAUM, JR., Chicago, Ill.
ARCH MCKINLEY, Pittsburgh, Pa.
VICENTE MOLINA, Merida, Yucatan, Mexico
CLARE DELOSS MURRAY, Newark, N. Y.
LAWRENCE KENNETH NEEDHAM, Empire, Canal Zone, Panama
EDWARD NEWTON NOYES, Dallas, Tex.
CHARLES WALTER PALMER, Philadelphia, Pa.
ALBERT WARING PIERSON, Niagara Falls, N. Y.
HENRY GEORGE PORTER, New York City

HAROLD ALVA RANDS, Estacada, Ore.
LE ROY WOODSON, San Pedro de Macoris, Santo Domingo

As JUNIORS.

HAROLD EATON BABBITT, Chicago, Ill.
HAROLD BURD CATLIN, Pelham Manor, N. Y.
HART CUMMIN, Bonny Eagle, Me.
GEORGE MAYO, Berkeley, Cal.
WILLIAM GROVER MORRISON, Des Moines, Iowa
CHELIUS HAZEL SHEA, Memphis, Tenn.
FRED LEROY STEARNS, New York City
GEORGE WILLIAM STEPHENS, JR., Roland Park, Md.

The Secretary announced the transfer of the following candidates on April 2d, 1912:

FROM ASSOCIATE MEMBER TO MEMBER

JOHN HENRY BOWDITCH, New Brighton, N. Y.
FRANK DAVID CHASE, Oak Park, Ill.
ARTHUR CASSIDY EVERHAM, Kansas City, Mo.
EDWARD CRESWELL HEALD, Washington, D. C.
FRANCIS DEY HUGHES, Kansas City, Mo.
ELSWORTH MORTIMER LEE, New York City
JOHN LORENZO McCONNELL, Chicago, Ill.
GEORGE STEWART MINNIS, Buffalo, N. Y.
HOWARD SCOTT MORSE, Louisville, Ky.
CHARLES FREDERICK PARKER, Durango, Mexico
EDGAR ERNEST SEYFERT, Pittsburgh, Pa.

FROM JUNIOR TO ASSOCIATE MEMBER

RALPH AGUSTUS BEEBEE, Chicago, Ill.
LLOYD TILGHMAN EMORY, Philadelphia, Pa.
ERIC TURE KING, Cornwall-on-Hudson, N. Y.
ALFRED SIDNEY MALCOMSON, Freeport, N. Y.
OREN MCKENNEY MOULTON, Altmar, N. Y.
DANIEL WILLETS OVEROCKER, Utica, N. Y.
RAYMOND WASHINGTON PARLIN, Hagerstown, Md.
JAMES HAMMOND STONE, Santo Domingo, Santo Domingo
NATHANIEL AUGUSTINE THAYER, New York City

The Secretary announced the following deaths:

WILLIAM BELL WHITE HOWE, elected Member, March 1st, 1893; died February 11th, 1912.

DAVID SPENCER MERRITT, elected Member, January 4th, 1905; died March 6th, 1912.

CHARLES AUGUSTINE MINER, elected Associate Member, April 7th, 1897; Member, December 4th, 1901; died March 22d, 1912.

CHARLES EDWARD MOORE, elected Member, January 7th, 1880; died February 27th, 1912.

JOHN LAWRENCE POWER O'HANLY, elected Member, September 5th, 1883; died March 22d, 1912.

Adjourned.

OF THE BOARD OF DIRECTION.

(Abstract)

April 2d, 1912.—Vice-President Strobel in the chair; Chas. Warren Hunt, Secretary, and present, also, Messrs. Bush, Churchill, Endicott, Gerber, Kimball, Knap, Loomis, Ridgway, Snow, Staniford, and Thomson.

A proposed amendment to the Constitution revising Article VII, which relates to the method of nomination and election of officers, which has been under consideration by the Board for some time, was adopted, and the Secretary instructed to secure the necessary signatures for its legal presentation to the Society, and also to present to the next Annual Convention the recommendation of the Board that the proposed amendment be adopted.

A special Reception to the foreign delegates of the International Association for Testing Materials who will visit New York in September next was authorized.

The previous action of the Board in selecting Saratoga, N. Y., as the place for holding the next Annual Convention was reconsidered, and Seattle, Wash., was selected as the place for holding the Convention of 1912.

Vice-President Marx, Director Cattell and Secretary Hunt, were appointed a Committee of the Board of Direction to determine the date of the Convention and to take general charge of the arrangements.

The resignation of one Associate Member was accepted.

Ballots for membership were canvassed, resulting in the election of 7 Members, 25 Associate Members, and 8 Juniors, and the transfer of 9 Juniors to the grade of Associate Member.

Eleven Associate Members were transferred to the grade of Member. Applications were considered, and other routine business transacted.

Adjourned.

ANNOUNCEMENTS

The House of the Society is open from 9 A. M. to 10 P. M., every day, except Sundays, Fourth of July, Thanksgiving Day, and Christmas Day.

FUTURE MEETINGS

May 1st, 1912.—8.30 P. M.—A regular business meeting will be held, and two papers will be presented for discussion, as follows: "Faults in the Theory of Flexure," by Henry S. Prichard, M. Am. Soc. C. E.; and "A Reinforced Concrete Infiltration Well and Pumping Plant," by Frederick N. Hatch, Jun. Am. Soc. C. E.

Mr. Prichard's paper was printed in *Proceedings* for March, 1912, and Mr. Hatch's paper is printed in this number of *Proceedings*.

May 15th, 1912.—8.30 P. M.—At this meeting a paper by J. V. Davies, M. Am. Soc. C. E., entitled "Air Resistances of Trains in Tube Tunnels," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

June 5th, 1912.—8.30 P. M.—This will be a regular business meeting. A paper by C. E. Grunsky, M. Am. Soc. C. E., entitled "The Appraisal of Public Service Properties as a Basis for the Regulation of Rates," will be presented for discussion.

This paper is printed in this number of *Proceedings*.

FORTY-FOURTH ANNUAL CONVENTION

Notice of Change of Time and Place.

In the March Number of *Proceedings* a brief announcement was made that the Forty-fourth Annual Convention would be held at **Saratoga, N. Y., June 4th, 1912.**

Since that time the Board of Direction has reconsidered its action in fixing both the time and the place. This was done because of many requests received from the membership located all along the Pacific Coast and elsewhere in the West, and to the many logical arguments advanced for making the change. The decision was not made, however, until it was ascertained that a majority of the whole Board was in favor of the change.

The Convention of 1912 will be held at **Seattle, Wash., June 25th to 28th, 1912**, inclusive.

A Committee of the Board of Direction to take general charge of the arrangements for the Convention consisting of Vice-President Marx, Director W. A. Cattell, and Chas. Warren Hunt, Secretary, has been appointed, and it is hoped that a circular containing information in regard to programme, etc., will be issued in ample time for members to make arrangements to be present.

SEARCHES IN THE LIBRARY

In January, 1902, the Secretary was authorized to make searches in the Library, upon request, and to charge therefor the actual cost to the Society for the extra work required. Since that time many searches have been made, and bibliographies and other information on special subjects furnished.

The resulting satisfaction, to the members who have made use of the resources of the Society, in this manner, has been expressed frequently, and leaves little doubt that, if it were generally known to the membership that such work would be undertaken, many would avail themselves of it.

The cost is trifling compared with the value of the time of an engineer who looks up such matters himself, and the work can be performed quite as well, and much more quickly, by persons familiar with the Library.

In asking that such work be undertaken, members should specify clearly the subject to be covered, and whether references to general books only are desired, or whether a complete bibliography, involving search through periodical literature, is desired.

In reference to this work, the Appendices* to the Annual Reports of the Board of Direction for the years ending December 31st, 1906, and December 31st, 1910, contain summaries of all searches made to date.

PAPERS AND DISCUSSIONS

Members and others who take part in the oral discussions of the papers presented are urged to revise their remarks promptly. Written communications from those who cannot attend the meetings should be sent in at the earliest possible date after the issue of a paper in *Proceedings*.

All papers accepted by the Publication Committee are classified by the Committee with respect to their availability for discussion at meetings.

Papers which, from their general nature, appear to be of a character suitable for oral discussion, will be published as heretofore in *Proceedings*, and set down for presentation to a future meeting of the Society, and, on these, oral discussions, as well as written communications, will be solicited.

All papers which do not come under this heading, that is to say, those which, from their mathematical or technical nature, in the opinion of the Committee, are not adapted to oral discussion, will not be scheduled for presentation to any meeting. Such papers will be published in *Proceedings* in the same manner as those which are to

* *Proceedings*, Vol. XXXIII, p. 20 (January, 1907); Vol. XXXVII, p. 28 (January, 1911).

be presented at meetings, but written discussions, only, will be requested for subsequent publication in *Proceedings* and with the paper in the volumes of *Transactions*.

LOCAL ASSOCIATIONS OF MEMBERS OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS

San Francisco Association

The San Francisco Association of Members of the American Society of Civil Engineers holds regular bi-monthly meetings, with banquet, and weekly informal luncheons. The former are held at 6 p. m., at the Palace Hotel, on the third Friday of February, April, June, August, October, and December, the last being the Annual Meeting of the Association.

Informal luncheons are held at 12.15 p. m. every Wednesday, and the place of meeting may be ascertained by communicating with the Secretary of the Association, E. T. Thurston, Jr., M. Am. Soc. C. E., 713 Mechanics' Institute, 57 Post Street.

The by-laws of the Association provide for the extension of hospitality to any member of the Society who may be temporarily in San Francisco, and any such member will be gladly welcomed as a guest.

(Abstract of Minutes of Meeting)

February 16th, 1912.—The meeting was called to order; President Grunsky in the chair; E. T. Thurston, Jr., Secretary; and present, also, 83 members and guests.

Preliminary to the business meeting, views of the active construction work on the dam across the Mississippi River, at Keokuk, Iowa, were shown by moving picture films, and President Grunsky delivered his Inaugural Address.

Charles Derleth, Jr., M. Am. Soc. C. E., Chairman of the Committee representing the Association, made a progress report on the work done in connection with the proposed Engineering Congress to be held at the Panama-Pacific Exposition.

Chas. Warren Hunt, M. Am. Soc. C. E., Secretary of the American Society of Civil Engineers, who was the guest of the Association, addressed the meeting, describing briefly the management of the Engineering Congresses of 1893 and 1904.

A paper entitled "Water Power Development Under Government Control," was presented by O. C. Merrill, Assoc. M. Am. Soc. C. E., and the subject was discussed by Messrs. Galloway, Hall, Cattell, Wagoner, and the author.

Adjourned.

Colorado Association

The meetings of the Colorado Association of Members of the American Society of Civil Engineers are held on the second Saturday

of each month, except July and August. The hour and place of meeting are not fixed, but this information will be furnished on application to the Secretary, Gavin N. Houston, M. Am. Soc. C. E., 409 Equitable Building, Denver, Colo. The meetings are usually preceded by an informal dinner. Members of the American Society of Civil Engineers will be welcomed at these meetings.

Weekly luncheons are held on Wednesdays, and, until further notice, will take place at the Colorado Traffic Club.

Visiting members are urged to attend the meetings and luncheons.

(Abstract of Minutes of Meetings)

February 17th, 1912.—The meeting was called to order; Vice-President Comstock in the chair; and present, also, 8 members and 4 guests.

An informal discussion on Rock Fill Dams was opened by Mr. Comstock, and the subject was discussed by all those present at the meeting.

Adjourned.

March 16th, 1912.—The meeting was called to order; Vice-President C. W. Comstock in the chair; and present, also, 13 members and 7 guests.

The minutes of the February, 1912, meeting were read and approved.

Mr. Comstock read a letter from A. R. Livingston, M. Am. Soc. C. E., introducing the following resolution, which was passed unanimously:

"The members of the Colorado Association of the American Society of Civil Engineers desire to express in such manner as they are able, their feeling of sorrow and regret at the loss of William Chatten Wetherill, M. Am. Soc. C. E., whose sudden and unexpected death on the tenth of February deprived the profession of an able engineer and the members of this association and many others in this city and elsewhere throughout the country, of a sincere and true friend.

"In all he undertook he was conscientious and thorough, not given to hasty judgment, but weighing facts carefully before forming his opinions.

"He had a good word and one of encouragement for those who called on him for advice and help, and was never heard to criticise harshly or unjustly anyone or anyone's actions.

"All who have had the privilege of having him for a friend realize their great loss which will not be lessened as the years pass.

"He was born a gentleman and was a gentleman to the end.

"It is hereby resolved that the above expression of our esteem and sorrow be entered in the minutes of the meeting and that the Secretary be instructed to send a copy to the members of the family."

An informal discussion on "Construction Contracts," was opened by C. S. Lambie, Assoc. M. Am. Soc. C. E., who was followed by two guests, Messrs. McMurray and Fording, and all the members present.

Adjourned.

**PRIVILEGES OF ENGINEERING SOCIETIES
EXTENDED TO MEMBERS OF THE
AMERICAN SOCIETY OF CIVIL ENGINEERS**

Members of the American Society of Civil Engineers will be welcomed by the following Engineering Societies, both to the use of their Reading Rooms and at all Meetings:

American Institute of Mining Engineers, 29 West Thirty-ninth Street, New York City.

American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York City.

Architekten-Verein zu Berlin, Wilhelmstrasse 92, Berlin W. 66, Germany.

Associação dos Engenheiros Civis Portuguezes, Lisbon, Portugal.

Australasian Institute of Mining Engineers, Melbourne, Victoria, Australia.

Boston Society of Civil Engineers, 715 Tremont Temple, Boston, Mass.

Brooklyn Engineers' Club, 117 Remsen Street, Brooklyn, N. Y.

Canadian Society of Civil Engineers, 413 Dorchester Street, West, Montreal, Que., Canada.

Civil Engineers' Society of St. Paul, St. Paul, Minn.

Cleveland Engineering Society, Chamber of Commerce Building, Cleveland, Ohio.

Cleveland Institute of Engineers, Middlesbrough, England.

Dansk Ingeniorforening, Amaliegade 38, Copenhagen, Denmark.

Engineers' and Architects' Club of Louisville, Ky., 303 Norton Building, Fourth and Jefferson Streets, Louisville, Ky.

Engineers' Club of Baltimore, Baltimore, Md.

Engineers' Club of Minneapolis, 17 South Sixth Street, Minneapolis, Minn.

Engineers' Club of Philadelphia, 1317 Spruce Street, Philadelphia, Pa.

Engineers' Club of St. Louis, 3817 Olive Street, St. Louis, Mo.

Engineers' Club of Toronto, 96 King Street, West, Toronto, Ont., Canada.

Engineers' Society of Northeastern Pennsylvania, 302 Board of Trade Building, Scranton, Pa.

Engineers' Society of Pennsylvania, 219 Market Street, Harrisburg, Pa.

Engineers' Society of Western Pennsylvania, 2511 Oliver Building, Pittsburgh, Pa.

Institute of Marine Engineers, 58 Romford Road, Stratford, London, E., England.

Institution of Engineers of the River Plate, Buenos Aires, Argentine Republic.

Institution of Naval Architects, 5 Adelphi Terrace, London, W. C., England.

Junior Institution of Engineers, 39 Victoria Street, Westminster, S. W., London, England.

Koninklijk Instituut van Ingenieurs, The Hague, The Netherlands.

Louisiana Engineering Society, 321 Hibernia Bank Building, New Orleans, La.

Memphis Engineering Society, Memphis, Tenn.

Midland Institute of Mining, Civil and Mechanical Engineers, Sheffield, England.

Montana Society of Engineers, Butte, Mont.

North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England.

Oesterreichischer Ingenieur- und Architekten-Verein, Eschenbachgasse 9, Vienna, Austria.

Pacific Northwest Society of Engineers, 803 Central Building, Seattle, Wash.

Rochester Engineering Society, Rochester, N. Y.

Sachsenischer Ingenieur- und Architekten-Verein, Dresden, Germany.

Sociedad Colombiana de Ingenieros, Bogota, Colombia.

Sociedad de Ingenieros del Peru, Lima, Peru.

Societe des Ingenieurs Civils de France, 19 Rue Blanche, Paris, France.

Society of Engineers, 17 Victoria Street, Westminster, S. W., London, England.

Svenska Teknologforeningen, Brunkebergstorg 18, Stockholm, Sweden.

Tekniske Forening, Vestre Boulevard 18-1, Copenhagen, Denmark.

Western Society of Engineers, 1737 Monadnock Block, Chicago, Ill.

ACCESSIONS TO THE LIBRARY

(From March 7th to April 4th, 1912)

DONATIONS *

THE WORLD'S MINERALS.

By Leonard J. Spencer. Cloth, $8\frac{1}{4}$ x $5\frac{1}{2}$ in., illus., 11 + 272 pp. New York, Frederick A. Stokes Company, 1911. \$2.17.

In this book, the author states, an attempt has been made to present, in popular language, an interesting and readable account of various minerals, their practical applications, their importance as ores of the metals, as precious stones, etc. Descriptions of 116 species of the more common minerals, as well as of a few of the more important ones, are given, and these are illustrated by 40 colored plates prepared under the direction of Dr. Hans Lenk, Professor of Mineralogy and Geology in the University of Erlangen, representing actual specimens belonging to the mineral collection under his charge. Although their use is avoided as much as possible, technical terms are explained, it is stated, in the preliminary chapter, and the attention of the student and collector is called to such of the more prominent physical characters of the minerals as will help him to identify his own specimens. The Chapter headings are: Introduction; The Forms of Minerals; The Physical Characters of Minerals; The Chemical Composition and Classification of Minerals; The Native Elements; The Sulphides, Arsenides, and Sulphur-Salts; The Haloids; The Oxides; The Carbonates; The Sulphates, Chromates, Molybdates, and Tungstates; The Phosphates, Arsenates, and Vandadates; The Silicates; The Titanio-Silicates, Titanates, and Niobates; The Organic Substances; Index.

NOTES ON HEATING AND VENTILATION.

By John R. Allen. Third Edition. Cloth, $8\frac{1}{4}$ x $5\frac{1}{4}$ in., illus., 6 + 227 pp. Chicago, Domestic Engineering Company, 1911. \$2.50.

This book, it is stated, has been written primarily for the steamfitter and the designer of heating systems, and presupposes some elementary knowledge of the details of the construction and operation of the simpler forms of heating plants. The subject-matter is a reprint of a series of articles published in *Domestic Engineering*, and has been rewritten and enlarged for this edition. It is shown, it is stated, that the subject can be developed in a logical way from the fundamental principles of engineering. The author has included the results of a series of experiments, carried on at the University of Michigan, in regard to the actual laws of heat and the values of the constants entering into these laws. These results are given in a number of tables, and serve to give, the author states, the designer actual data from actual experiments on which to base his calculations. There is also included a résumé of the results of German experiments and methods of determining heat losses from buildings. Having used the previous editions as a text for his classes in Heating and Ventilation, the author states that the present edition has been written with a view to making the book more desirable as a college text. The Contents are: Introduction; Heat Losses from Buildings; Different Forms of Heating; The Design of a Direct Steam-Heating System; Design and Installation of an Indirect Steam-Heating System; Steam-Boilers and Steam-Piping; Steam-Piping; Design of a Hot Water Heating System; Hot Water Boilers and Piping; Ventilation; Design of Hot Air Heating System; Fan System of Heating; A Central Heating System; Piping, Covering and Other Appliances; Auxiliary Devices for Heating System; Index.

STANDARD FORMS OF FIELD NOTES FOR CIVIL ENGINEERS.

By Chas. C. Anthony. Cloth, 7 x $4\frac{1}{4}$ in., illus., 12 + 55 pp. New York and London, McGraw-Hill Book Company, 1912. \$1.00.

Little space is given usually, the author states, in books dealing with Surveying and Railroad Location, to the art of recording notes, and he, therefore, publishes this book with the hope that note-taking may be simplified and standardized. As many engineers find difficulty in recording the results of their surveys so that they are clear to the draftsman, his aim has been to present forms for note-taking, together with such instructions, that an engineer can take a complete set of notes and record the results of a survey in a workmanlike manner. The Contents are: Station Layout Surveys; Level Notes; Stadia Survey Notes; Curve Rerunning and Spiral Notes; Construction Cross-Section Notes to be Used in the Calculation of Earthwork; Transit Notes; Hydrographic Surveying.

* Unless otherwise specified, books in this list have been donated by the publisher.

MARINE STEAM TURBINES:

Forming the Supplementary Volume to "Marine Engines and Boilers." By G. Bauer and O. Lasche, Assisted by E. Ludwig and H. Vogel. Translated from the German and Edited by M. G. S. Swallow. Cloth, $9\frac{1}{2}$ x $6\frac{1}{2}$ in., illus., 16 + 214 pp. New York, The Norman W. Henley Publishing Co.; London, Crosby Lockwood and Son, 1911. \$3.50.

As a work on Marine Engines is not complete without dealing with the Steam Turbine, and as the use of the latter for the propulsion of naval vessels has greatly increased, this volume, as stated in the title, is published as a supplement to Dr. Bauer's book on Marine Engines and Boilers. Being supplementary, its contents have been made as concise as possible, only those types of turbines which have been adopted definitely being referred to, but if a further edition is necessary, the scope of the book, it is stated, will be extended. Only a short description of the theory of the steam turbine is included, but with this, and the large number of illustrations given, the authors hope that the volume will serve marine engineers as an introduction to the theory of marine turbine design. In the translation all formulas are expressed in the metric and English units, in order that the volume may be more useful to the English speaking engineer. The Contents are: Part I, Introduction; Part II, General Remarks on the Design of a Turbine Installation; Part III, The Calculation of Steam Turbines; Part IV, Turbine Design; Part V, Shafting and Propellers; Part VI, Condensing Plant; Part VII, Arrangement of Turbines; Part VIII, General Remarks on the Arrangement of Steam Turbines in Steamers; Part IX, Turbine-Driven Auxiliaries; Part X, Tables; Index.

DIRECTORY TO THE IRON AND STEEL WORKS OF THE UNITED STATES:

Second Supplement to the 1908 Edition. Compiled and Published by the American Iron and Steel Association. Corrected to January 1, 1912. Cloth, $8\frac{1}{2}$ x 6 in., 80 pp. Philadelphia, The American Iron and Steel Association, 1912. \$5.00.

As stated on the title-page, this Supplement, with its predecessor published in 1910, brings down to the close of 1911, all essential details of new blast furnaces, rolling mills, and steel works which have been undertaken or completed in the United States since 1908, together with the important changes which have taken place, in ownership and equipment, in plants previously described. It also includes an alphabetical list of electric and special furnaces for the manufacture of pig iron, metal suitable for use in puddling and in open-hearth steel furnaces, etc., but which does not include furnaces for the manufacture or refining of steel. This is followed by a list of all the blast furnaces in the United States arranged alphabetically by States, up to January 1st, 1912, including the kinds of fuel used, the grades of pig iron made, and the year the furnaces were last in blast. There is also a list of recently abandoned or dismantled furnaces. It is stated in the preface that from the Directory published in 1908, and its Supplements of 1910 and 1911, the manufacturer or business man may secure any and all the information he needs concerning the equipment and ownership of all the blast furnaces, rolling mills, steel works, and tin plate mills in the United States. The Contents are: Preface; The United States Steel Corporation; Independent Companies (Arranged Alphabetically by Company); Independent Companies (Arranged by States); Latest Information; Electric and Special Furnaces; Complete List of Blast Furnaces; Abandoned or Dismantled Blast Furnaces.

MAXIMUM PRODUCTION IN MACHINE-SHOP AND FOUNDRY.

By C. E. Knoeppel. (Works Management Library.) Cloth, $7\frac{1}{2}$ x 5 in., illus., 6 + 365 pp. New York, The Engineering Magazine, 1911. \$2.50.

The material on which this book is based appeared originally in a series of articles in *The Engineering Magazine*, at various times from October, 1908, to May, 1911. For its present form, the subject-matter has been re-arranged, it is stated, from the viewpoint of a larger experience and maturer study of mechanical industries, as well as more advanced principles and methods of management, the result being, the editor states, a logical, well proportioned, and well balanced development of the subject. Everything contained in the book is said to represent

some phase or period of the author's personal experience in busy manufacturing plants. The author devotes the first chapters of his book to a discussion of the principles of organization and management in both the shop and the foundry, these discussions being followed by special applications of the same ideas, first in the shop and then in the foundry, the latter receiving more and closer attention, it is stated, because it has been less thoroughly studied by systematic methods. The Chapter headings are: The Two Great Forces in Manufacturing; Importance of Efficient Organization; The Elements of Accounting and Management; Maintenance, New Construction and Reconstruction; Systematic Processing, Assembly, and Erection; Efficiency in the Use of Materials and Time; Better Deliveries—More Satisfied Customers; Scientific Management in the Foundry; Foundry Organization and Management; Foundry Production and Its Details; Efficient Despatching in the Foundry; Handling Shop Details; Importance of Correct Burden Apportionment; Elements of Foundry Production Costs; Apportionment of Foundry Costs to Production; Cost Apportionment in Various Classes of Foundries.

APPLIED METHODS OF SCIENTIFIC MANAGEMENT.

By Frederic A. Parkhurst. Cloth, 9 $\frac{1}{2}$ x 6 in., illus., 12 + 325 pp. New York, John Wiley & Sons; London, Chapman & Hall, Limited, 1912. \$2.00.

This work is stated to be an amplification of the author's article on the same subject, which appeared in *Industrial Engineering* in 1911. An appendix has been added to the original publication which is stated to contain much new matter. While the principles of scientific management always remain the same, the author states that the methods used to incorporate these principles into a practical organization must be modified or expanded to meet specific requirements. In this book he has described in detail the application of such methods, using as an illustration a history of their application to the Ferracut Machine Company, manufacturers of presses and dies of Bridgeton, N. J. The methods described follow those laid down by Mr. Taylor, and are stated to be particularly adapted to a business employing about 100 people. The author's purpose is not to describe a system of scientific management which can be installed by a novice, but he hopes that the book may be an aid to the business man in locating the deficiencies in his own specific line and induce him to adopt scientific methods in the management of his business. The Contents are: The Preliminary Investigation, etc.; The Functions of the Sales Department and Counting Room, etc.; The Planning Department; Systematic Routing a Necessity; Importance of a Modern System of Stores; The Standardization of Methods and Tools, etc.; Preliminary Work Necessary Before Attempting to Make Time Studies; A Concrete Example of the Course an Order Takes from its Possible Existence as an Enquiry to its Shipment Complete, etc.; Appendix.

THIRD NATIONAL CONFERENCE ON CITY PLANNING:

Proceedings, Philadelphia, Pennsylvania, May 15-17, 1911. Cloth, 9 $\frac{1}{2}$ x 6 $\frac{1}{2}$ in., 11 + 293 pp. Cambridge, The University Press, 1911. \$1.50. (Donated by the National Conference on City Planning.)

The purpose of these conferences, of which this is the third, others having been held in 1909 and 1910, is stated to be the opportunity afforded for personal discussion of such phases of the subject as the intelligent control and guidance of the entire physical growth, alteration, and equipment of cities, as well as the problems of relieving and avoiding congestion, etc., by those concerned with the different sides of the subject. The object of the discussion is said to be a clearer understanding of the views expressed and to aid in making city conditions healthier, more pleasant, and more economical for those who live among them. A partial list of the Contents is: The Municipal Real Estate Policies of German Cities, by Frederick C. Howe; Public Buildings, by Ernest Flagg; The Location of Public Buildings in Parks and Other Public Open Spaces, by Frank Miles Day; Buildings in Relation to Street and Site, by Lawrence Veiller; Condemnation, Assessments and Taxation in Relation to City Planning, by Lawson Purdy; The Water Terminal Problem, by George E. Hooker; A Survey of American Dock Development, by George C. Sikes; The Organization of the Port of New York, by Calvin Tomkins; Philadelphia Harbor Improvements, by Joseph Hasskarl; Los Angeles Harbor, by T. E. Gibbon; Baltimore Harbor Improvements, by Oscar F. Lackey; Street Widths and Their Subdivision, by Nelson P. Lewis; The Narrowing of Minor Residence Streets as Affecting Tenant and Owner, by Charles Mulford Robinson; Standardized Street Widths, by John Nolen; The Legal Aspect of City Planning, by Walter L. Fisher; Certain Principles of a Uniform City Planning Code, by Andrew Wright Crawford; etc., etc.

TREATISE ON HYDRAULICS.

By Mansfield Merriman, M. Am. Soc. C. E. Ninth Edition, Revised and Reset With the Assistance of Thaddeus Merriman, M. Am. Soc. C. E. Cloth, 9 $\frac{1}{2}$ x 6 in., illus., 10 + 565 pp. New York, John Wiley & Sons; London, Chapman & Hall, Limited, 1912. \$4.00.

The authors, it is stated, have endeavored, in this book to unify their presentation of the subject of Hydraulics in a manner advantageous to the technical student and the practicing engineer, and to present it more clearly and concisely, in order to advance the interest of thorough education and to promote sound engineering practice. In order that the advances made in the subject in the last decade might be shown, it was necessary to revise and reset the whole text and to include new matter on hydraulic instruments, methods of measuring water, oblique weirs, etc. Some old matter is stated to have been omitted or condensed, and a few changes in the arrangement of the subject-matter have been made, such as placing the hydraulic tables in the text with the explanations of them, instead of at the end of the book, etc. The tables of coefficients for orifices, weirs, etc., have been revised and extended to include the results of recent experiments. Many examples and problems are given, as well as historical notes and references. The most important data, coefficients, and formulas are given in both English and metric measures. The Contents are: Fundamental Data; Hydrostatics, Theoretical Hydraulics; Instruments and Observations; Flow Through Orifices; Flow of Water Over Weirs; Flow of Water Through Tubes; Flow of Water Through Pipes; Flow in Conduits; The Flow of Rivers; Water Supply and Water Power; Dynamic Pressure of Water; Water Wheels; Turbines; Naval Hydromechanics; Pumps and Pumping; Appendix; Mathematical Tables; Hydraulic Tables in Text; Index.

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Orientation of Buildings or Planning for Sunlight. By William Atkinson. John Wiley & Sons, New York; Chapman & Hall, Limited, London, 1912.

The American Year Book, 1911: A Record of Events and Progress. Edited by Francis G. Wickware, Under Direction of a Supervisory Board Representing National Learned Societies. D. Appleton and Company, New York and London, 1912.

Irrigation and Drainage: Principles and Practice of Their Cultural Phases. By F. H. King. Seventh Edition. The Macmillan Company, New York and London, 1911.

Neuere Kraftanlagen: Eine technische und wirtschaftliche Studie auf Veranlassung der Jagorstiftung der Stadt Berlin unter Mitwirkung von Dr. Ing. Gensecke und Dr. Ing. Hanszel, bearbeitet von E. Josse. Zweite Auflage. R. Oldenbourg, München und Berlin, 1911.

Mining Without Timber. By Robert Bruce Brinsmade. McGraw-Hill Book Company, New York and London, 1911.

The Metallurgy of Iron and Steel. By Bradley Stoughton. Second Edition. McGraw-Hill Book Company, New York and London, 1911.

Das Eisenbahnwesen der Gegenwart dargestellt auf Grund der Verhältnisse der deutschen Bahnen. Herausgegeben unter Förderung des Preussischen Ministers der öffentlichen Arbeiten, des Bayerischen Staatsministers für Verkehrsangelegenheiten, und der Eisenbahn-Zentralbehörden anderer Deutscher Bundesstaaten. 2 Vol. Reimar Hobbing, Berlin, 1911.

The Metallurgy of Steel. By F. W. Harbord and J. W. Hall. Fourth Edition, Enlarged and Revised. The Metallurgical Series, Edited by Professor Sir W. Roberts-Austen. J. B. Lippincott Co., Philadelphia; Charles Griffin & Co., Ltd., London, 1911.

The Encyclopaedia of Municipal and Sanitary Engineering: A Handy Working Guide in all Matters Connected with Municipal and Sanitary Engineering and Administration. Edited by W. H. Maxwell and J. T. Brown. D. Van Nostrand Company, New York, 1910.

Neue Theorie und Berechnung der Kreiselräder, Wasser- und Dampfturbinen, Schleuderpumpen und -Gebläse, Turbokompressoren, Schrau-

bengebläse und Schiffspropeller. Von Hans Lorenz. Zweite, neubearbeitete und vermehrte Auflage. R. Oldenbourg, München und Berlin, 1911.

Elektrotechnik in Einzeldarstellungen. Herausgegeben von Gustav Benischke. Heft 16, Die Konstruktionen Elektrischer Maschinen, von W. Peineke. Friedr. Vieweg & Sohn, Braunschweig, 1912.

The Primer of Irrigation. By D. H. Anderson. Irrigation Age Company, Chicago, 1910.

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RESIGNATION

ASSOCIATE MEMBER

Date of
Resignation.

SEARS, THOMAS BARTLETT..... April 2, 1912

DEATHS

MELVILLE, GEORGE WALLACE. Elected Honorary Member, December 20th, 1899; died March 17th, 1912.
 JACKSON, THOMAS MOORE. Elected Member, June 3d, 1891; died February 3d, 1912.
 MERRITT, DAVID SPENCER. Elected Member, January 4th, 1905; died March 6th, 1912.
 MINER, CHARLES AUGUSTINE. Elected Associate Member, April 7th, 1897; Member, December 4th, 1901; died March 22d, 1912.
 MOORE, CHARLES EDWARD. Elected Member, January 7th, 1880; died February 27th, 1912.
 O'HANLY, JOHN LAWRENCE POWER. Elected Member, September 5th, 1883; died March 22d, 1912.
 OLNEY, LAFAYETTE. Elected Member, October 7th, 1868; died March 2d, 1912.

Total Membership of the Society, April 4th, 1912,

6 425.

MONTHLY LIST OF RECENT ENGINEERING ARTICLES OF
INTEREST

(March 9th to April 3d, 1912)

NOTE.—*This list is published for the purpose of placing before the members of the Society, the titles of current engineering articles, which can be referred to in any available engineering library, or can be procured by addressing the publication directly, the address and price being given wherever possible.*

LIST OF PUBLICATIONS

In the subjoined list of articles, references are given by the number prefixed to each journal in this list:

(1) *Journal, Assoc. Eng. Soc.*, 31 Milk St., Boston, Mass., 30c.
 (2) *Proceedings, Engrs. Club of Phila.*, 1317 Spruce St., Philadelphia, Pa.
 (3) *Journal, Franklin Inst.*, Philadelphia, Pa., 50c.
 (4) *Journal, Western Soc. of Engrs.*, Monadnock Blk., Chicago, Ill., 50c.
 (5) *Transactions, Can. Soc. C. E.*, Montreal, Que., Canada.
 (6) *School of Mines Quarterly*, Columbia Univ., New York City, 50c.
 (8) *Stevens Institute Indicator*, Stevens Inst., Hoboken, N. J., 50c.
 (9) *Engineering Magazine*, New York City, 25c.
 (10) *Cassier's Magazine*, New York City, 25c.
 (11) *Engineering* (London), W. H. Wiley, New York City, 25c.
 (12) *The Engineer* (London), International News Co., New York City, 35c.
 (13) *Engineering News*, New York City, 15c.
 (14) *Engineering Record*, New York City, 12c.
 (15) *Railway Age Gazette*, New York City, 15c.
 (16) *Engineering and Mining Journal*, New York City, 15c.
 (17) *Electric Railway Journal*, New York City, 10c.
 (18) *Railway and Engineering Review*, Chicago, Ill., 15c.
 (19) *Scientific American Supplement*, New York City, 10c.
 (20) *Iron Age*, New York City, 20c.
 (21) *Railway Engineer*, London, England, 25c.
 (22) *Iron and Coal Trades Review*, London, England, 25c.
 (23) *Bulletin, American Iron and Steel Assoc.*, Philadelphia, Pa.
 (24) *American Gas Light Journal*, New York City, 10c.
 (25) *American Engineer*, New York City, 20c.
 (26) *Electrical Review*, London, England.
 (27) *Electrical World*, New York City, 10c.
 (28) *Journal, New England Water-Works Assoc.*, Boston, Mass., \$1.
 (29) *Journal, Royal Society of Arts*, London, England, 15c.
 (30) *Annales des Travaux Publics de Belgique*, Brussels, Belgium.
 (31) *Annales de l'Assoc. des Ing. Sortis des Ecoles Spéciales de Gand*, Brussels, Belgium.
 (32) *Mémoires et Compte Rendu des Travaux*, Soc. Ing. Civ. de France, Paris, France.
 (33) *Le Génie Civil*, Paris, France.
 (34) *Portefeuille Économiques des Machines*, Paris, France.
 (35) *Nouvelles Annales de la Construction*, Paris, France.
 (36) *Cornell Civil Engineer*, Ithaca, N. Y.
 (37) *Revue de Mécanique*, Paris, France.
 (38) *Revue Générale des Chemins de Fer et des Tramways*, Paris, France.
 (42) *Proceedings, Am. Inst. Elec. Engrs.*, New York City, \$1.
 (43) *Annales des Ponts et Chaussées*, Paris, France.
 (44) *Journal, Military Service Institution*, Governors Island, New York Harbor, 50c.
 (45) *Mines and Minerals*, Scranton, Pa., 25c.
 (46) *Scientific American*, New York City, 15c.
 (47) *Mechanical Engineer*, Manchester, England.
 (48) *Zeitschrift, Verein Deutscher Ingenieure*, Berlin, Germany.
 (49) *Zeitschrift für Bauwesen*, Berlin, Germany.
 (50) *Stahl und Eisen*, Düsseldorf, Germany.
 (51) *Deutsche Bauzeitung*, Berlin, Germany.
 (52) *Riga sche Industrie-Zeitung*, Riga, Russia.
 (53) *Zeitschrift, Oesterreichischer Ingenieur und Architekten Verein*, Vienna, Austria.
 (54) *Transactions, Am. Soc. C. E.*, New York City, \$4.
 (55) *Transactions, Am. Soc. M. E.*, New York City, \$10.
 (56) *Transactions, Am. Inst. Min. Engrs.*, New York City, \$6.

(57) *Colliery Guardian*, London, Eng- (86) *Engineering-Contracting*, Chicago, land. Ill., 10c.
 (58) *Proceedings*, Engrs. Soc. W. Pa., (87) *Railway Engineering and Main- 803 Fulton Bldg., Pittsburgh, tenance of Way*, Chicago, Ill., Pa., 50c. 10c.
 (59) *Transactions*, Mining Inst. of Scot- (88) *Bulletin of the International Ry. land, London and Newcastle- Congress Assoc.*, Brussels, Bel- upon-Tyne, England.gium.
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 (61) *Proceedings*, Western Railway (90) *Transactions*, Inst. of Naval Club, 225 Dearborn St., Chicago, Archts., London, England.
 Ill., 25c.
 (62) *Industrial World*, 59 Ninth St., (91) *Transactions*, Soc. Naval Archts. Pittsburgh, Pa., 10c. and Marine Engrs., New York City.
 (63) *Minutes of Proceedings*, Inst. C. E., (92) *Bulletin*, Soc. d'Encouragement London, England. pour l'Industrie Nationale, Paris, France.
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 (65) *Official Proceedings*, New York (93) *Revue de Métallurgie*, Paris, Railroad Club, Brooklyn, N. Y., France, 4 fr. 50c.
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 (95) *International Marine Engineering*, New York City, 20c.
 (67) *Cement and Engineering News*, Chicago, Ill., 25c.
 (96) *Canadian Engineer*, Toronto, Ont., Canada, 10c.
 (68) *Mining Journal*, London, England.
 (70) *Engineering Review*, New York City, 10c.
 (71) *Journal, Iron and Steel Inst.*, Lon- (98) *Journal*, Engrs. Soc. Pa., 219 don, England. Market St., Harrisburg, Pa., 30c.
 (71a) *Carnegie Scholarship Memoirs*, Iron and Steel Inst., London, England.
 (99) *Proceedings*, Am. Soc. of Municipal Improvements, New York City, \$1.50.
 (73) *Electrician*, London, England, 18c.
 (74) *Transactions*, Inst. of Min. and Metal, London, England.
 (75) *Proceedings*, Inst. of Mech. Engrs., London, England.
 (76) *Brick*, Chicago, Ill., 10c.
 (77) *Journal*, Inst. Elec. Engrs., Lon- (100) *Professional Memoirs*, Corps of don, England.
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 (78) *Beton und Eisen*, Vienna, Austria.
 (79) *Forscharbeiten*, Vienna, Austria.
 (80) *Tonindustrie Zeitung*, Berlin, Ger- many.
 (81) *Zeitschrift für Architektur und In- genieurwesen*, Wiesbaden, Ger- many.
 (83) *Progressive Age*, New York City, 15c.
 (84) *Le Ciment*, Paris, France.
 (85) *Proceedings Am. Ry. Eng. Assoc.*, Chicago, Ill.

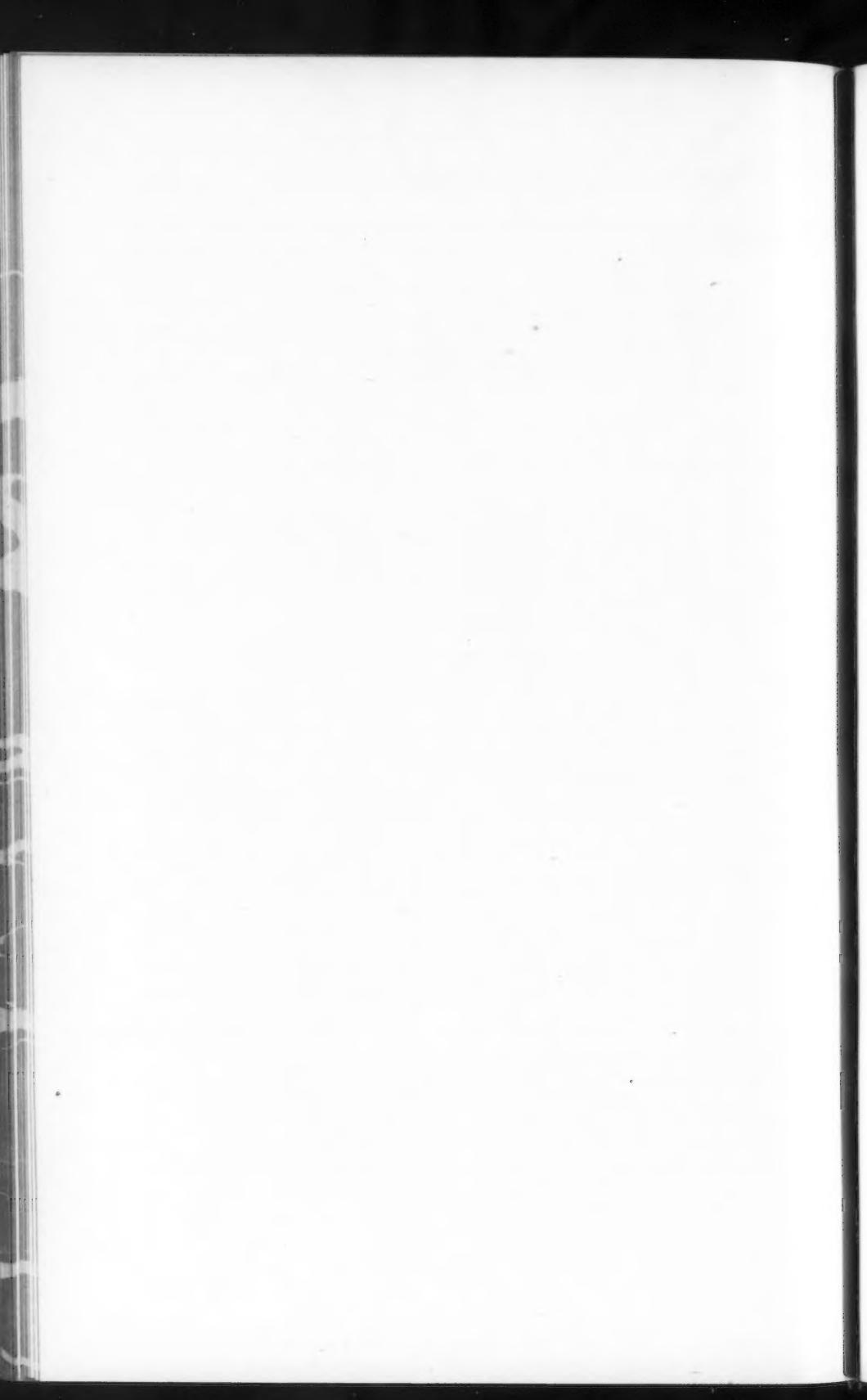
(101) *Metal Worker*, New York City, 10c.
 (102) *Organ für die Fortschritte des Eisenbahnwesens*, Wiesbaden, Germany.
 (103) *Mining and Scientific Press*, San Francisco, Cal., 10c.
 (104) *The Surveyor and Municipal and County Engineer*, London, Eng- land, 6d.
 (105) *Metallurgical and Chemical En- gineering*, New York City, 25c.
 (106) *Transactions*, Inst. of Mining Engrs., London, England, 6 shillings.
 (107) *Schweizerische Bauzeitung*, Zürich, Switzerland.
 (108) *Southern Machinery*, Atlanta, Ga., 10c.

LIST OF ARTICLES.

Bridges.

Reinforced Concrete Bridge Across the Almendares River, Havana, Cuba.* Eugene Klapp and W. J. Douglas, Members, Am. Soc. C. E. (54) Vol. 74.
 Steel Centering Used in the Construction of the Rocky River Bridge, Cleveland, Ohio. Wilbur J. Watson, M. Am. Soc. C. E.* (54) Vol. 74.
 Reinforced-Concrete Bridge at Farnworth.* (11) Mar. 1.
 Bascule Bridge Over Harbor Channel at Copenhagen.* C. Van Langendonck. (15) Mar. 8.
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 A Five-Track Plate-Girder Bridge with Ballasted Floor.* (14) Mar. 9.
 The Fifth Avenue Vladuct at Fitchburg.* (14) Mar. 9.
 A Pony-Truss Highway Bridge with Concrete Floor.* (14) Mar. 9.
 The Brady Avenue Bridge.* (14) Mar. 16.
 Braced Bridge Piers on Soft Ground.* (14) Mar. 16.
 Reinforced-Concrete Vladuct Carrying a Seattle Street over Railway Yards.* E. E. Adams. (13) Mar. 21.
 Erecting 110-ft. Plate-Girders with a Long-Reach Derrick Car.* E. A. Gibbs. (13) Mar. 21.

*Illustrated.

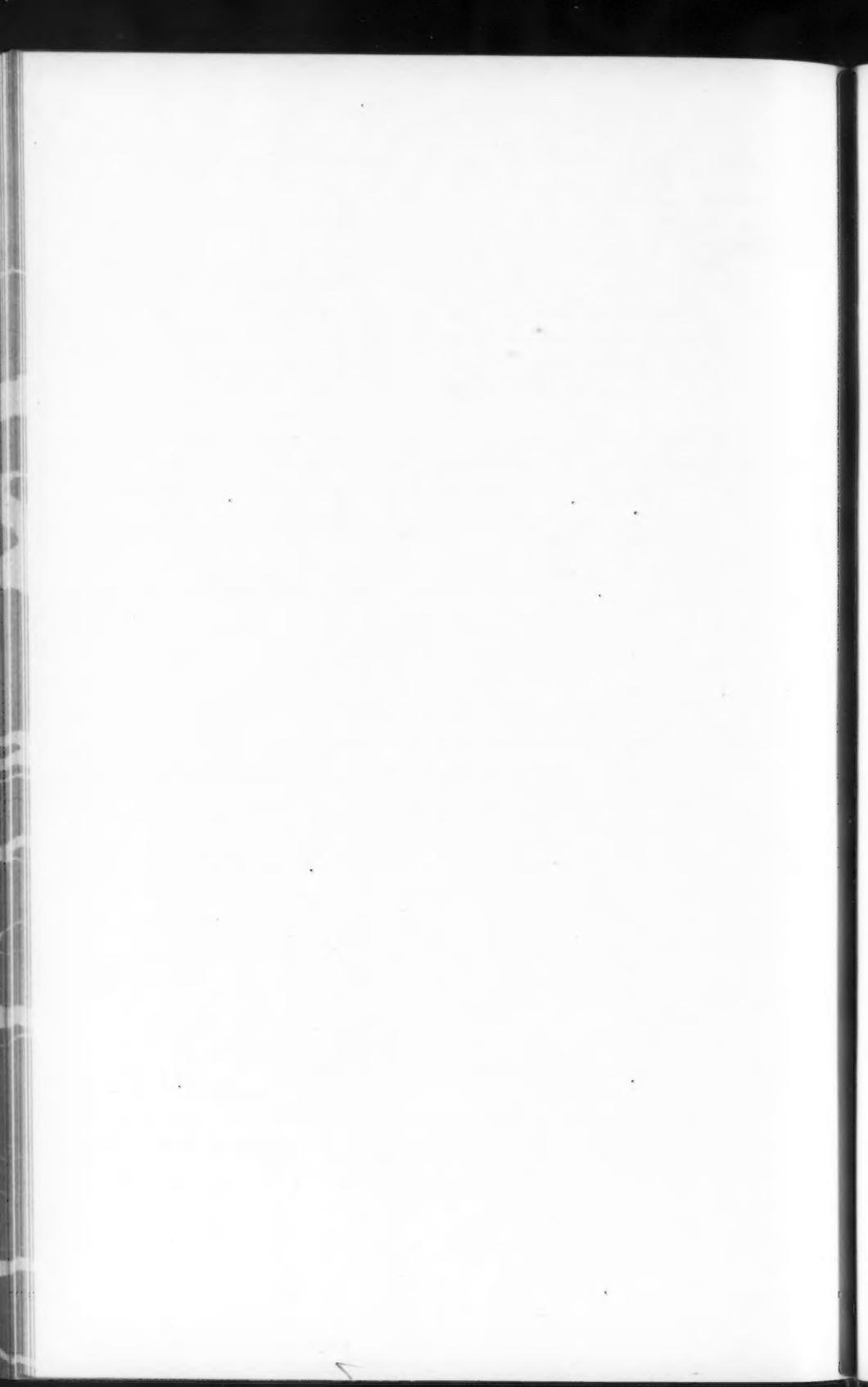


Bridges—(Continued).

An Ornamental Highway Bridge, a Concrete Arch in Kansas City, Missouri, with Foundations 40 Feet Deep.* (14) Mar. 23.
 The Reinforced-Concrete Bridge at Tempe, Ariz.* (13) Mar. 28.
 Bridge Construction on the Oregon Trunk Railway.* (15) Mar. 29.
 Le Pont du Risorgimento, sur le Tibre, à Rome.* Louis Quesnel. (43) Jan.
 Note sur les Travaux d'Elargissement des Ponts sur la Seine à Puteaux et à Neuilly-Saint-James.* Caldagues. (43) Jan.
 Zur Standsicherheitsuntersuchung schiefer gewölbter Brücken.* A. Hofmann. (81) Pt. 2.
 Gleichungen über die Formänderung vollwandiger Bögen.* Joh. Duwe. (81) Pt. 2.
 Schienenverstufung und Übergangslaschen an den Stössen auf der Drehbrücke über den Oberhafen in Hamburg.* Carl Ernst Susemihl. (102) Mar. 1.
 Neubau der Dove-Brücke in Charlottenburg.* Zangemeister. (51) Serial beginning Mar. 16.

Electrical.

Modern High-Voltage Power Transformers in Practice; With Special Reference to a "T" Three-Unit System.* William T. Taylor. (77) Feb.
 The Mechanical Design of Direct Current Turbo-Generators.* R. J. Roberts. (77) Feb.
 Notes on National and International Standards for Electrical Machinery.* Robert Pohl. (77), Feb.
 Small Electricity Supply Undertakings. Percy A. Spalding. (77) Feb.
 The Mutual Attractions or Repulsions of Two Electrified Spherical Conductors. Alexander Russell. (77) Feb.
 Brushes* (For Motors). W. R. Whitney. (3) Mar.
 Saving Effected by the Electric Lighting of Small Stations. Sussmann. (From *Zeitung des Vereins deutscher Eisenbahnverwaltungen*.) (88) Mar.
 Degradation of Accumulated Energy.* Alfred G. Collis. (Paper read before the South Wales Inst. of Engrs.) (57) Mar. 1.
 Héroult Electric Furnace at Braintree.* (22) Mar. 8.
 Recent Experiments on Directive Wireless Telegraphy with Earth Antenna.* F. Kleibitz. (Abstract of translation from Communication from the Imperial Telegraphs Experiment Station.) (73) Mar. 8.
 The Theory of the Submarine Telegraph Cable. H. W. Malcolm. (73) Serial beginning Mar. 8.
 Some Modern Problems of Illumination.* T. Thorne Baker. (29) Mar. 8.
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 Distributed Leakage in Telephone and Telegraph Systems. Frank F. Fowle. (27) Mar. 9.
 Commercial Electrical Apparatus for 100 000 Volt Service. S. Q. Hayes. (Abstract of paper read before the Congress Internazionale delle Applicazioni Elettriche.) (73) Mar. 15.
 Current and Power Factors in Induction Motors.* H. J. S. Heather. (Abstract of paper read before the South African Inst. of Engrs.) (73) Mar. 15.
 200 Ton Electric Revolving Cantilever Crane.* (11) Mar. 15.
 Electric Power in a Japanese Shipbuilding Yard.* (26) Mar. 15.
 The Thickness of Insulation on Wires and Cables.* J. H. Lendl. (27) Mar. 16.
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 Electrical Power at the New Immingham Dock of the Great Central Railway Co.* (73) Serial beginning Mar. 22.
 On the Designs of Dynamo Electric Machinery. A. E. Clayton. (73) Serial beginning Mar. 22.
 Some Considerations on the Choice of Auxiliary Plant for Power Stations. A. H. Finch. (Abstract of paper read before the North-East Coast Inst. of Engrs. and Shipbuilders.) (73) Mar. 22.
 Electrical Installation of Mount Wilson Solar Observatory.* Howard S. Knowlton. (27) Mar. 23.
 Regulation of Radiotelegraphy.* Robert A. Morton, Jr. (19) Mar. 23.
 Design and Construction of a Reinforced Concrete Telegraph Pole Line Across the Hackensack Meadows, New Jersey.* George Gibbs, M. Am. Soc. C. E. (Paper read before the National Assoc. of Cement Users.) (86) Mar. 27.
 Lake Shore Station of Cleveland Electric Illuminating Company.* (27) Mar. 30.
 An Underground System and a Few Developments.* S. B. Clark. (42) Apr.
 Alternating-Current Systems of Underground Distribution.* S. J. Lisberger and C. J. Wilson. (42) Apr.
 Automatic Private Branch Exchange Development in San Francisco.* Gerald Deakin. (42) Apr.
 Electrification of a Reversing Mill of the Algoma Steel Co.* Bradley T. McCormick. (42) Apr.



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Self Starting Synchronous Motors. Carl J. Fechheimer. (42) Apr.
 Central Station Practice in the Anthracite Coal Fields.* (62) Apr. 1.
 Wires for Direct-Current Circuits. Cecil P. Poole. (64) Apr. 2.
 Elektrische Temperaturmessung und Fernablesung unter besonderer Berücksichtigung des thermoelektrischen Verfahrens.* Alfred Schwartz. (48) Serial beginning Feb. 10.
 Das vereinfachte elektrische Stellwerk.* Niemann. (48) Feb. 17.
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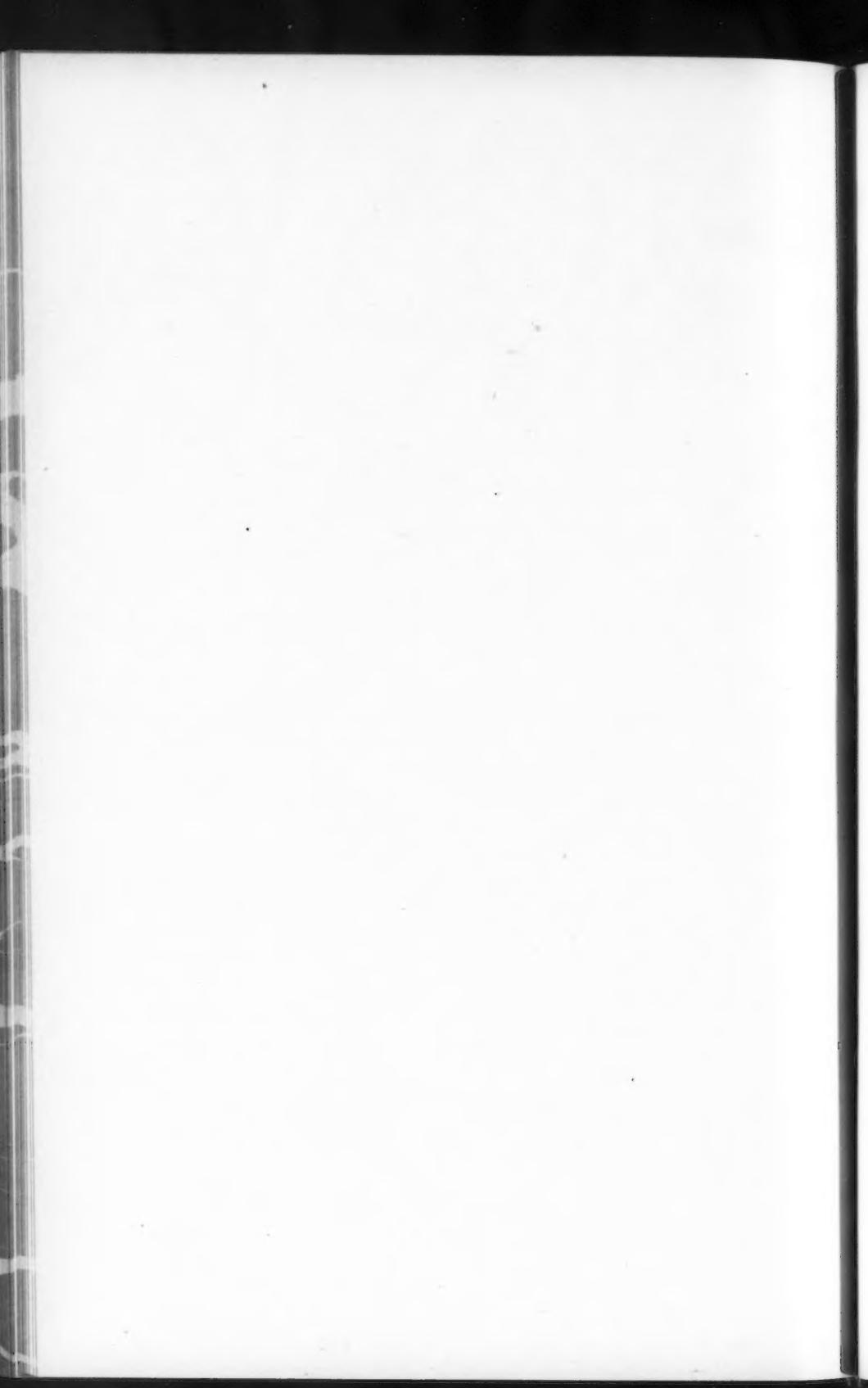
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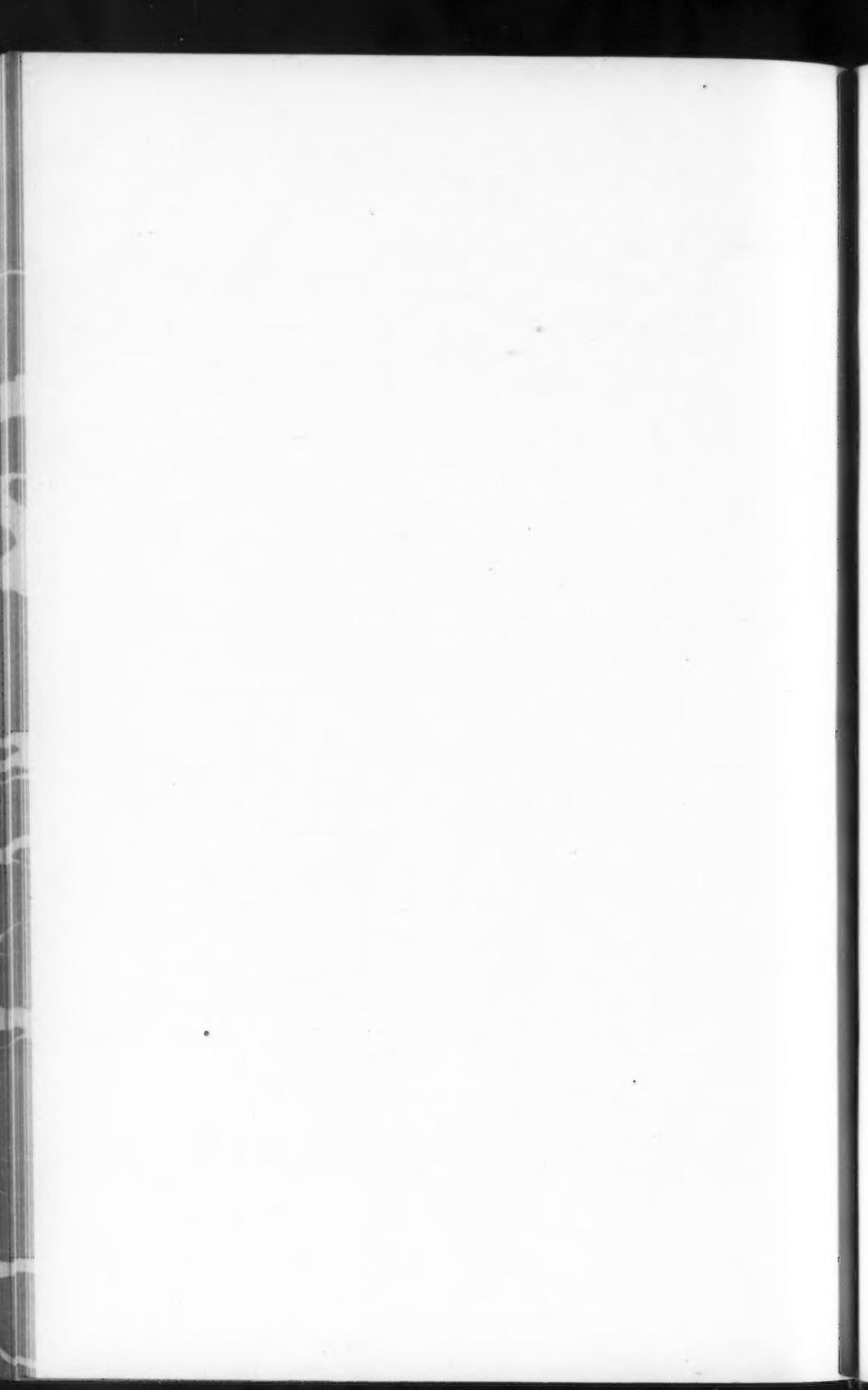
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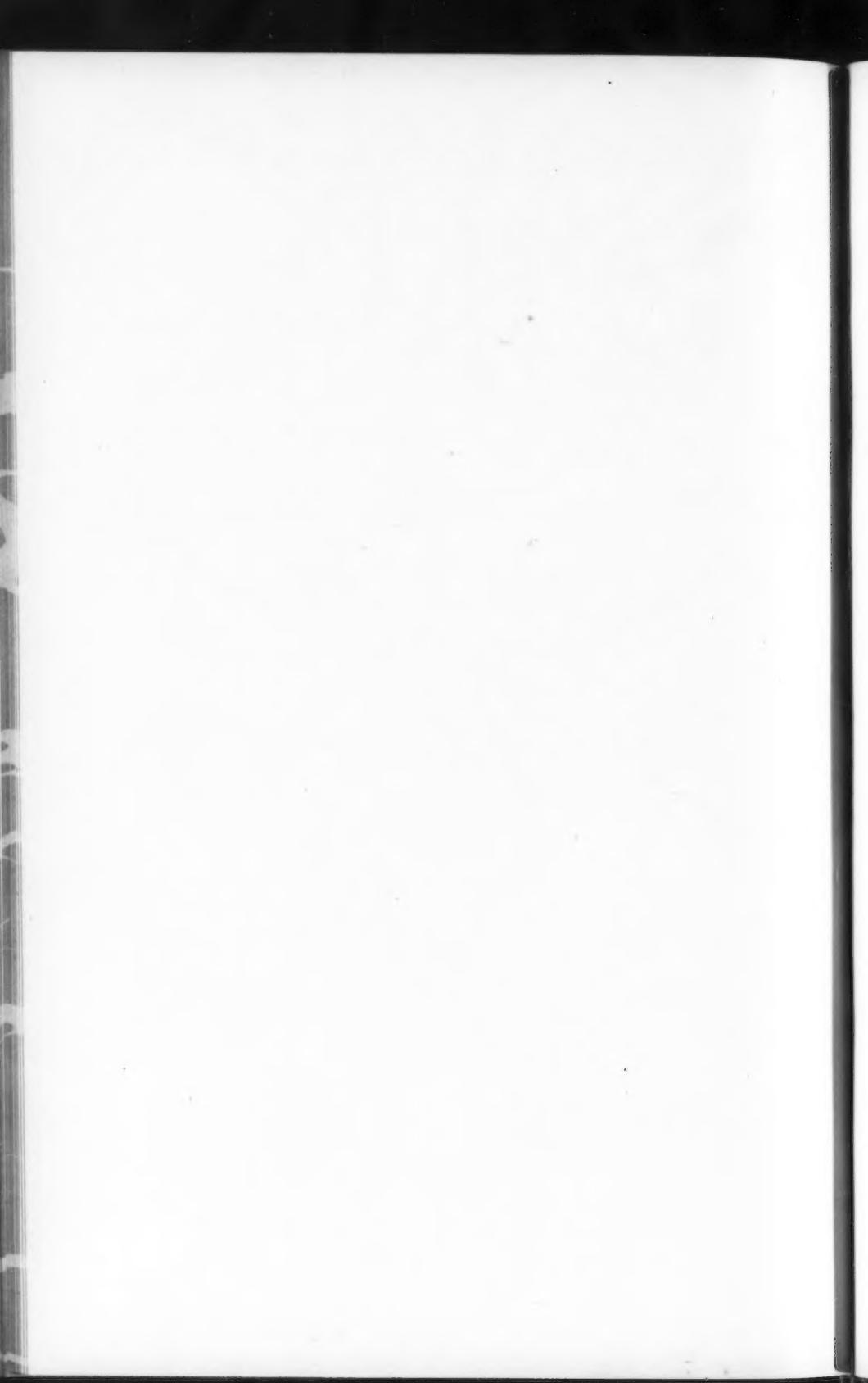
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*Illustrated.



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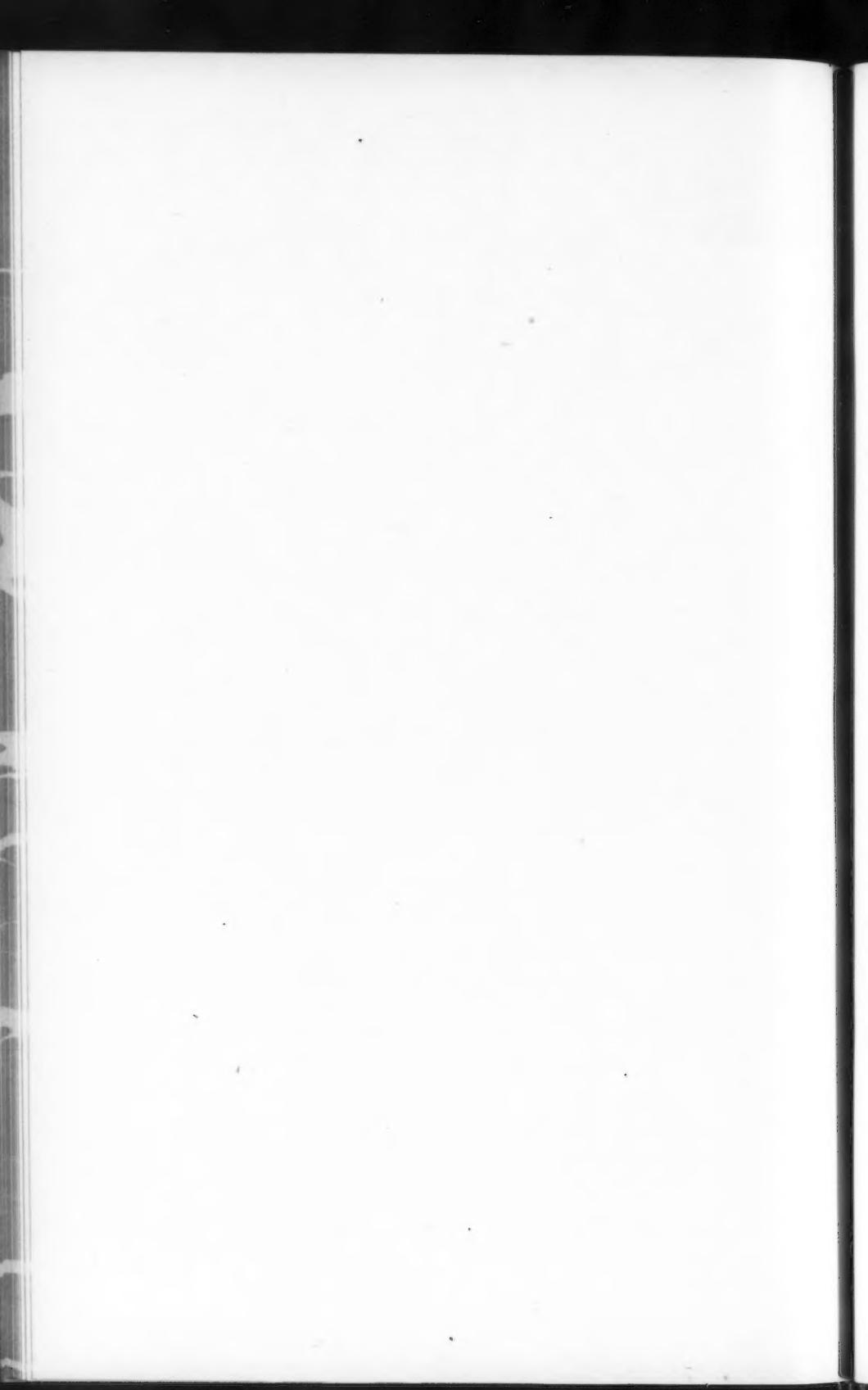
Concrete Building with Composite Column Foundations.* (14) Mar. 23.
 The Practical Design of Reinforced Concrete Flat Slabs.* Sanford E. Thompson.
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 (Paper read before the National Assoc. of Cement Users.) (96) Mar. 28;
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Water Supply.

Two Earth Dams of the United States Reclamation Service.* D. C. Henny, M. Am. Soc. C. E. (54) Vol. 74.
 The Flow of Water in Cylindrical Conduits.* Sidney A. Reeve. (54) Vol. 74.
 The Present-Day Pumping Engine for Water-Works.* Charles Arthur Hague, M. Am. Soc. C. E. (54) Vol. 74.
 A Reinforced Concrete Stand-Pipe.* W. W. Clifford, Jun. Am. Soc. C. E. (54) Vol. 74.
 Experiments on the Flow of Water in Wood Stave Pipes.* E. A. Moritz, Assoc. M. Am. Soc. C. E. (54) Vol. 74.
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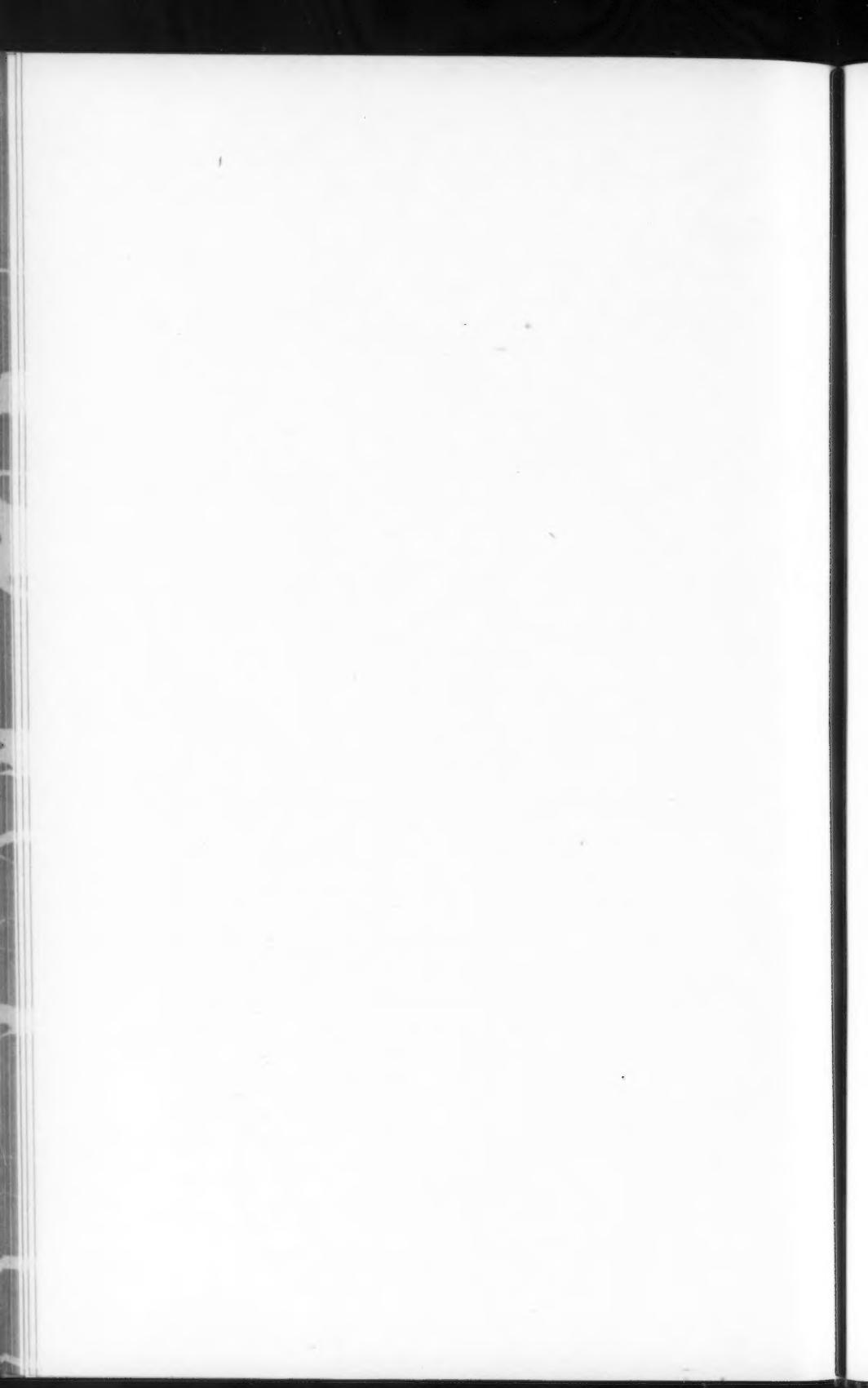
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